X3.2/612
Dec. 18, 1967
Revision of
X3.2/633

PROPOSED ADDENDUM TO
USA STANDARD CODE
FOR INFORMATION INTERCHANGE
(X3.4-1967)

Reference p. 7 -

Change title of Section 3 to read:

3. Character Representation and Code Identification

Add to end of the existing Section 3:

The standard code may be identified by the use of the notation "ASCII" or "USASCII".

The notation "ASCII" (pronounced as'-key) or "USASCII" (pronounced you-sas'-key) should ordinarily be taken to mean the code prescribed by the latest issue of the standard. To explicitly designate a particular (perhaps prior) issue, the last two digits of the year of issue may be appended, as, "ASCII 63" or "USASCII 63".

Reference p. 8 -

Add to the definition of LF (Line Feed):

Where appropriate, this character may have the meaning "New Line" (NL), a format effector which controls the movement of the printing point to the first printing position on the next printing line. Use of this convention requires agreement between sender and recipient of data.

Reference p. 13 -

Add to Appendix A, Section A7:

A7.6 The function "New Line" (NL) was associated with LF (rather than with CR or with a separate character) to provide the most useful combinations of functions through the use of only two character positions, and to allow the use of a common end-of-line format for both printers having separate CR-LF functions and those having a combined (i.e., NL) function. This sequence would be CR-LF, producing the same result on printers of both classes, and would be useful during conversion of a system from one method of operation to the other.

Enclosure 1

X3.2/642
Dec. 18, 1967
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EXPOSITORY REMARKS ON THE PROPOSED ADDENDUM TO X3.4-1967

X3.4-1967 explicitly recognized only the use of distinct Carriage Return (CR) and Line Feed (LF) functions on page-oriented printers or display devices. However, there is a rather extensive trend in the information-handling field to utilize a single end-of-line control character (New Line - NL). Prior practice in some cases has implied the replacement of the function CR by NL, and in other cases, replacement of LF by NL. Thus, as more systems adopted the "New Line" approach, the compatibility between them was seriously jeopardized.

The ISO 7-bit code proposals have, for some time, recognized as an option the replacement of LF with NL where appropriate. This choice has two advantages:

1. It retains the character CR, which appears to be of more potential utility as a complement to NL than would LF. CR can be used for returning on the same line for underlining, mass application of diacritical marks, and similar purposes. Uses of LF alone are hard to postulate. Even the feeding of several lines, as between paragraphs, can be done with repetitions of NL.

2. On occasion it may be desirable to provide for interoperation between printers having separate CR and LF functions and those having a NL function. This may arise when a system is being progressively converted from one mode to the other. If NL is associated with the character LF, then the sequence CR-LF may be used as a common end-of-line sequence for both modes.

   The printing point is twice commanded to return to the left margin, but with no ill effect. If NL were associated with the character CR, then any equivalent sequence would cause double line spacing on the "New Line" printer.

Subcommittee X4-A9 (Keyboards) has urged the inclusion of this provision in the code standard.

5. It is possible to specify a common character sequence that would accomodate both New Line (NL) and CR-LF options as well as an arbitrary number of "time fill" characters to accomodate variations in machine "return" times. The sequence CR, LF, DELete, for instance, when detected in a device with either option would produce the desired result. The DELete code's sole function is to provide additional time for the carriage to return. When required, special provisions could be made with either option to accomodate machines with even longer "return" times. For example, a computer could be programmed to monitor and insert the proper number of "fill" characters required by individual machines.

6. Changing from a two character sequence (CR-LF) to a three character sequence (CR-LF-DEL) in order to accomodate the "New Line" option seems to be more loss than gain from a user's viewpoint, unless such a sequence is to be used as transitional aid in converting an entire system over to the "New Line" option.

7. From a system standpoint, options such as proposed in the subject Addendum create compatibility problems without compensating advantages. Up to this time the ASCII Code has made provision only for CR-LF. Some manufacturers have, however, implemented New Line on ASCII code devices, some using the Line Feed code, others using the Carriage Return code. One justification advanced for the proposed Addendum is that it will guide implementation when "New Line" is used.

8. Questions such as the following are of concern to users:

   a. Should a choice be made between either a two character sequence (i.e. CR-LF) or a one character sequence (i.e. New Line) followed by either a specific fixed number of fill characters or a sequence tailored specifically in each case to the requirements of the receiving device or devices? If so, which one?

   b. Should the two options be included in the Standard so that CR-LF or New Line can be applied where each can be used most advantageously, accepting the penalty of compatibility adjustment in mixed systems or between systems where both options are in use?

9. Simple answers to such questions are not readily available. It is not clear whether the "New Line" option is a response to user demand or simply a manufacturer's choice in each case. Your responses may shed some light on this question.

10. To an increasing extent, it seems necessary to consider Federal Government ADP facilities as part of a total system. Standardization is the primary tool for compatible integration, particularly on a evolutionary intermediate and long-range basis. From this standpoint, choosing one of the two options seems preferable to allowing both to exist indefinitely.

NBS
5/13/68

Compatibility Considerations of New Line Versus Carriage Return - Line Feed Functions in Information Processing Systems

1. The proposed Addendum to the USA Standard Code for Information Interchange, X3.4-1967, if approved, will provide, on an optional basis, for the use of "New Line" in lieu of the two character sequence "Carriage Return (CR) - Line Feed (LF)" now specified in the Standard. The code to be used for "New Line" is the "Line Feed". Hence, machines designed to function on the "New Line" code would both return the carriage and feed one line when the "New Line" code was detected. This code would, of course, be the same code as assigned to Line Feed (LF) in the code table.

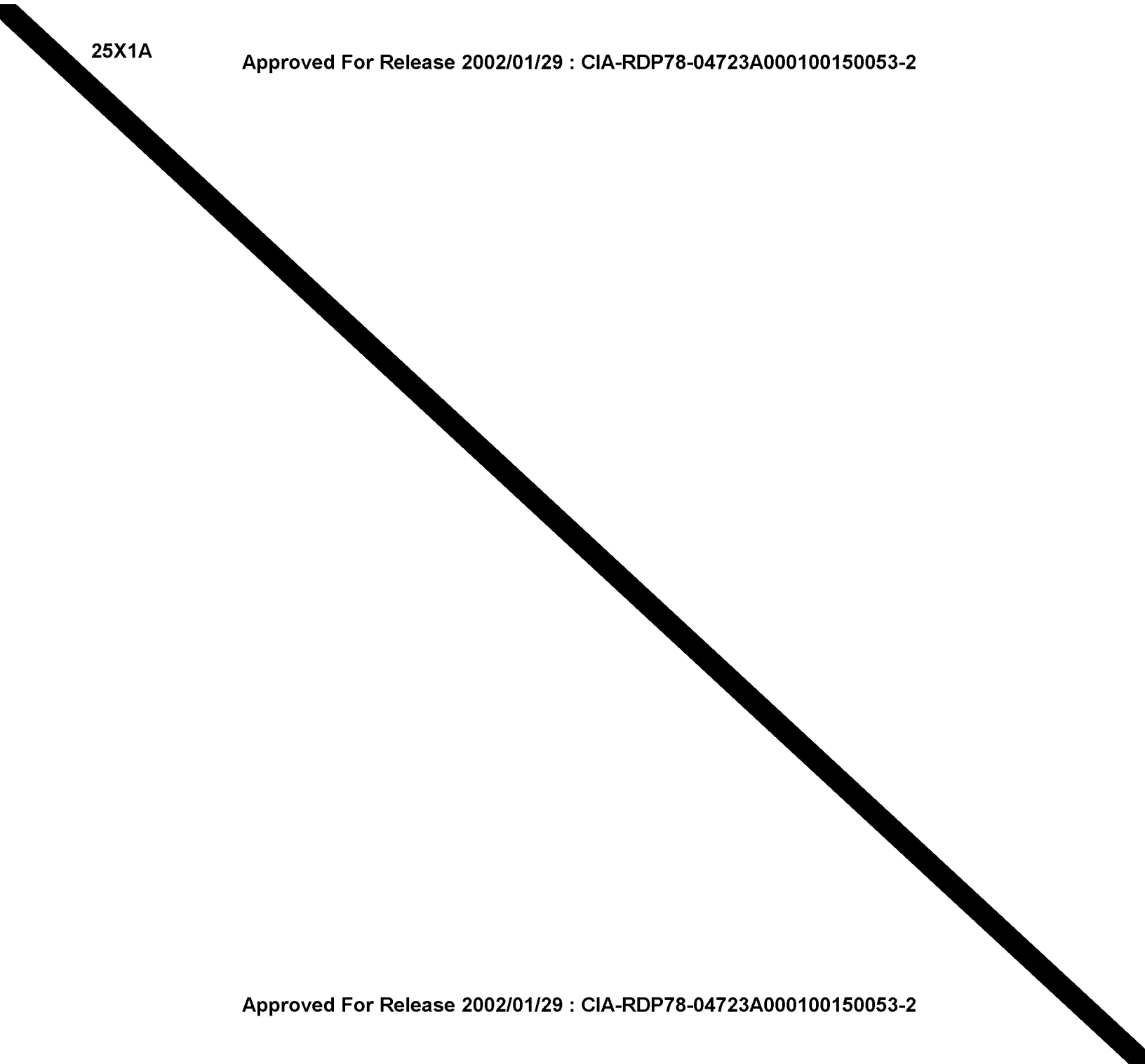
2. In evaluating the merits of this proposed option from a user's standpoint, two factors seem particularly significant. These are:

   a. The effect of these options on the operational compatibility between machines using different options,

   b. Machine response time considerations.

3. It seems reasonable to assume that machines which function on "New Line" will perform both carriage return and line feed when the character sequence CR-LF is detected. Based on this assumption, it can be said that a device which operates on "New Line" is compatible (for receiving) with a device which operates on CR followed by LF. The reverse, however, is not true. A device which requires two codes, CR and LF, will respond with line feed only upon detection of the "New Line" code. The use of the two options within a system, or between systems which intercommunicate, will give rise to functional incompatibility, which must be resolved on some basis not provided in the code standard. Presumably machines using the NL option will not normally have provisions for obtaining the line feed function except as combined with the carriage return function in NL.

4. The actual time required to complete the carriage return - line feed functions on various types and models of devices is also of significance. The general practice followed when CR-LF is used is entry of CR followed by LF. This sequence allows a time interval equal to two characters (In automatic transmission) for the carriage to return to the left margin before printing is required. In general, two characters times is sufficient to complete the functions of carriage return and line feed in communications type terminal devices. (The Department of Defense communication procedures specify CR-CR-LF; a sequence that probably had its origin in carriage return time requirements.) Electronic scanning devices, such as cathode ray tube display terminals, can of course return in a single character (New Line) time interval. Some terminal devices, which are basically adaptations of typewriters for use as data terminals require more than a two character time interval to complete the carriage return from the extreme right hand margin. One type-basket-type machine requires nine.



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